

REMARKS

This application has been reviewed in light of the Office Action dated July 30, 2002. Claims 1-6, 12-17, and 23-28 are pending in this application. Non-elected Claims 7-11, 18-22, and 29-33 have been cancelled without prejudice or disclaimer of the subject matter presented therein. Claims 1, 12, and 23 are the only independent claims, and they have been amended, as have Claims 2-6, 15, and 26 to define still more clearly what Applicants regard as their invention. Favorable reconsideration is requested.

The Office Action includes an objection to the drawings because they included reference numerals 31, 78, 86, and 87 not mentioned in the specification. In response, Applicants have amended the specification to refer to these reference numerals. Accordingly, Applicants believe that the objection to the drawings has been remedied, and its withdrawal is therefore respectfully requested.

The Office Action also includes an objection to the title of the invention and required a new title that is clearly indicative of the invention to which the claims are directed. Applicants have amended the title and believe that the objection has been remedied. Therefore, Applicants respectfully request withdrawal of the objection to the title.

The Office Action asserts an objection to the specification, on the grounds that the phrase "[i]n this embodiment, as user's operation upon selecting photography images serving as storage targets" on page 15, lines 5-7 of the specification, was unclear. In response, Applicants have amended this language to read, --In this embodiment, as the user selects photography images serving as storage targets--. The Examiner also objected to the specification because the identities of switches 103 and 104 were unclear. In response, Applicants have amended the specification to make clear that switch 103 is a display change switch and switch 104 is a switch for setting exposure. Applicants believe

that these objections to the specification have been remedied and therefore respectfully request withdrawal of these objections.

Claims 1-6 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which failed to reasonably convey possession of the claimed invention. In particular, the Office Action pointed out that the subject matter at issue was the phrase "said memory" in Claims 1, 4, and 5. Applicants have amended these claims so as to clarify the memory usage of the claimed invention. Applicants believe that these amendments have remedied this rejection and therefore respectfully request withdrawal of this rejection.

Claims 2, 6, 15, and 26 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In response, Applicants have replaced in Claim 2, "said storage device" with --said storage control device--, in Claim 6, "the stored middle-resolution" with --the middle-resolution--, and in Claims 15 and 26 "the display control step" with --the step of displaying the low-resolution image data--. Applicants believe that the rejection under Section 112, second paragraph, has been obviated, and its withdrawal is therefore respectfully requested.

In the Office Action, Claims 1, 4, 6, 12, 15, 17, 23, 26, and 28 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,215,523 (Anderson). The Office Action rejected Claims 2, 3, 13, 14, 24, and 25 under 35 U.S.C. § 103(a) as being unpatentable over Anderson, in view of U.S. Patent No. 5,956,084 (Moronaga et al.), and Claims 5, 16, and 27 under 35 U.S.C. § 103(a) as being unpatentable over Anderson, in view of U.S. Patent No. 5,764,800 (Yamagata). Applicants respectfully traverse these rejections.

Applicants submit that amended independent Claims 1, 12, and 23, together with the remaining claims dependent thereon, are patentably distinct from the cited prior

art at least for the following reasons.

Claim 1 requires an image pickup apparatus which includes an image pickup device adapted to pick up an image of an object to output an image signal; an image processing device adapted to process the image signal to generate first-resolution image data and second-resolution image data having a resolution which is not higher than that of the first-resolution image data; a storage control device adapted to store, in a memory, the first and second-resolution image data of the image signals of a plurality of frames which are obtained by picking up the image of the object; a display control device adapted to display the second-resolution image data of the plurality of frames stored in the memory on a display screen; a compression encoding device adapted to compress and encode, at a predetermined compression ratio, the first-resolution image data; and an output device adapted to output a compressed and encoded image data of a desired frame from the compressed and encoded image data of the plurality of frames of the image in response to selecting the desired frame.

One important feature of Claim 1 is the storage control device adapted to store, in a memory, the first and second-resolution image data of the image signals of a plurality of frames which are obtained by picking up the image of the object. This feature is described in the specification at least at page 13, lines 22-24, which states that the “photography images of the three consecutive frames which are photographed when the user depresses the photography timing designation button 9 may be obtained” In other words and with reference to Figure 1, multiple frames are picked up in response to one depression of a release button 9 to generate image data M1-M7 of different resolutions.

Another important feature of Claim 1 is the output device adapted to output a compressed and encoded image data of a desired frame from the compressed and encoded image data of the plurality of frames of the image in response to selecting the desired

frame. This feature is described in the specification at least at page 11, lines 11-14, which states that the “image compression encoding unit 18 sequentially reads out, as storage image data 19, the three high-resolution image data stored in the portions M2 to M4 in the buffer memory 11. In other words, the output device of Claim 1 outputs compressed and encoded image data from the multiple frames picked up in response to one depression of a release button 9. (It is to be understood, of course, that the scope of Claim 1 is not limited to the details of this embodiment, which is referred to only for purposes of illustration.)

Anderson, as understood by Applicants, relates to a method and system for accelerating a user interface of an image capture unit during a review mode, which includes providing a plurality of thumbnail images associated with a captured image. The Office Action states that, in Anderson, “[a]fter shutter button 418 is pressed, raw image data of a first resolution is stored in input buffers 538 of DRAM 346 (column 8, lines 59-60). The raw image data is used to create a thumbnail 606 of a second resolution (lower than the first resolution), which is stored in working memory 530 of DRAM 346 (column 9, lines 23-26).” Even if Anderson be deemed to teach or suggest the aforementioned features, Applicants submit that nothing in Anderson would teach or suggest the storage control device which stores the first and second resolution image data of the image signals of the plurality of frames which are obtained by picking up the image of the object, and the output device adapted to output compressed and encoded image data of the plurality of frames of the image, as recited in Claim 1. Applicants submit that Anderson picks up only one frame of an object in response to one depression of a shutter button (column 8, lines 57-64), whereas the storage control device and output device of Claim 1 picks up a plurality of frames obtained by picking up the image of the object. Accordingly, Applicants submit that Claim 1 is patentable over Anderson.

Independent Claims 12 and 23 are method and storage medium claims,

respectively, that correspond to apparatus Claim 1, and are believed to be patentable for at least the same reasons as discussed above in connection with Claim 1.

A review of the other art of record has failed to reveal anything that, in Applicants' opinion, would remedy the deficiencies of the art discussed above, as applied against the independent claims herein. Therefore, those claims are respectfully submitted to be patentable over the art of record.

The other rejected claims in this application depend from one or another of the independent Claims 1, 12, and 23 discussed above, and, therefore, are submitted to be patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants' undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,


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VERSION WITH MARKINGS TO SHOW CHANGES
MADE TO SPECIFICATION AND CLAIMS

The title beginning on page 1, has been amended as follows:

--IMAGE PROCESSING APPARATUS, METHOD, AND STORAGE
MEDIUM FOR DISPLAYING, COMPRESSING, AND ENCODING IMAGE
DATA--

Page 15, first paragraph, has been amended as follows:

--[In this embodiment, as user's operation upon selecting photography images serving as storage targets,] In this embodiment, as the user selects photography images serving as storage targets, the image file corresponding to the photography image selected from the image files C1 to C3 already compressed and encoded in the main memory 21 is directly transferred to the nonvolatile memory 24. As optional operation, the image compression encoding unit 18 can read out the high-resolution image data corresponding to the selected photography image from the buffer memory 11 again, compress and encode the readout data at a compression ratio different from that for the first time, store the compressed encoded data in the main memory 21, and finally store it in the nonvolatile memory 24.--

Page 22, third paragraph, has been amended as follows:

--Fig. 4A shows a display 31 of the image having no problem, Fig. 4B shows the image with underexposure, Fig. 4C shows the image with overexposure, and Fig. 4D shows the image with vibration.--

Page 23, first paragraph, has been amended as follows:

--In mode 2, only unsuccessful photography images discriminated from all the evaluated images are extracted and displayed in the thumbnail mode. The display can be switched by the deletion switch 106 in accordance with types 51 to 53 of unsuccessful photography or the degrees 54 of unsuccessful photography. Even in this state, the display change switch [104] 103 and the selection switches 107 and 108 can be operated to change the thumbnail display to normal display 55.--

Page 24, last paragraph, has been amended as follows:

--Image data in the flash memory 130 is fetched in a buffer 211 of the unsuccessful photography discrimination unit 120, and a luminance (Y) signal is extracted from the input image data by a Y/C separation circuit 71, thereby extracting a luminance signal histogram distribution (process 72). The extracted luminance histogram distribution is evaluated (process 73) to discriminate that the distribution in the lower range is evaluated as underexposure (process 74), and the distribution in the upper range is evaluated as overexposure (process 75). If the distribution falls within the set range, it is checked whether a high frequency components more than a predetermined value has been obtained (process 76). If YES in the process 76, normal exposure is discriminated (process 79); otherwise, vibration is discriminated (process 78). When the distribution falls outside the set range, a warning message is superposed on the image (process 77), and the resultant image is output to the V-RAM 128. By the above sequence, the underexposure, overexposure, and vibration of the photographed image can be discriminated, and their warning can also be performed.--

Page 25, last paragraph, has been amended as follows:

--Fig. 9 shows the sequence of deleting an image in a digital still camera having an optical finder. The technique of superposing the warning symbols on the photography images 32 to 34 in Figs. 4A to 4D and displaying them in the deletion sequence in the camera having the color liquid crystal monitor is replaced with a technique of informing the user of unsuccessful photography by the number of beep tones in place of the warning symbols. Note that the processes 83 to 85 are performed by evaluating, in a process 82, a photography image compressed and corrected in a process 81. Process 86 discriminates as to whether or not unsuccessful photography has occurred, and if so, generates a delete signal initiating process 87 to delete the data.--

VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. (Twice Amended) An image pickup apparatus comprising:

an image pickup device adapted to pick up an image of an object to output

an image signal;

an image processing device adapted to process the image signal to

generate first-resolution image data and second-resolution image data having a resolution which

is not higher than that of the first-resolution image data;

a storage control device adapted to store, in a memory, the first- and

second-resolution image data of the image signals of a plurality of frames which are obtained by

[processing the image signals] picking up the image of the object;

a display control device adapted to display the second-resolution image

data of the plurality of frames stored in said memory on a display screen;

a compression encoding device adapted to compress and encode, at a

predetermined compression ratio, the first-resolution image data [of the plurality of frames stored

in said memory]; and

[wherein said storage control] an output device [stores the compressed and

encoded image data of the plurality of frames in said memory, and outputs] adapted to output a

compressed and encoded image data of a desired frame from the compressed and encoded image

data of the plurality of frames [stored in said memory] of the image in response to selecting the

desired frame.

2. (Twice Amended) An apparatus according to claim 1, wherein said storage control device stores the selected image data in a non-volatile memory.
3. (Twice Amended) An apparatus according to claim 1, further comprising a transmission device adapted to transmit the selected image data.
4. (Twice Amended) An apparatus according to claim [1] 2, wherein said display control device extracts image data corresponding to the selected image selected from the compressed and encoded image data of the plurality of frames stored in said non-volatile memory and enlarges and displays the extracted image data on said display screen.
5. (Twice Amended) An apparatus according to claim 1, wherein said compression encoding device compresses and encodes the selected image data at a compression ratio different from the predetermined compression ratio [and stores the compressed and encoded image data in said memory].
6. (Twice Amended) An apparatus according to claim 1, wherein said image processing device processes the image signal obtained from said image pickup device to generate middle-resolution image data, and said display control device displays the [stored] middle-resolution image data on said display screen.

12. (Amended) An image pickup method comprising:
- a step of picking up an image of an object to output an image signal;
 - a step of processing the image signal to generate high-resolution image data and low-resolution image data;
 - a step of outputting designation so as to process the image signals of a plurality of frames in the image processing step;
 - a first storage step of storing the high- and low-resolution image data of the image signals of the plurality of frames which are obtained by [processing the image signals in accordance with the designation] picking up the image of the object;
 - a step of displaying an image;
 - a step of displaying, in the display step, the low-resolution image data of the plurality of frames stored in the first storage step;
 - a step of compressing and encoding, at a predetermined compression ratio, the high-resolution image data [of the plurality of frames stored in the first storage step];
 - a second storage step of storing the compressed and encoded image data of the plurality of frames; and
 - a first selection step of selecting and outputting image data of a desired frame from the image data of the plurality of frames of the image stored in the second storage step, on the basis of display in the display step.

15. (Amended) A method according to claim 12, wherein said method further comprises a second selection step of selecting a desired image from the plurality of images based on the low-resolution image data of the plurality of frames displayed in the display step, and the [display control] step of displaying the low-resolution image data extracts image data corresponding to the image selected in the second selection step from the image data of the plurality of frames stored in the second storage step and enlarges and displays the extracted image data in the display step.

23. (Amended) A storage medium storing a control program for an image pickup apparatus in a state readable from a computer, the control program comprising:

- a step of picking up an image of an object to output an image signal;
- a step of processing the image signal to generate high-resolution image data and low-resolution image data;
- a step of outputting designation so as to process the image signals of a plurality of frames in the image processing step;
- a first storage step of storing the high- and low-resolution image data of the image signals of the plurality of frames which are obtained by [processing the image signals in accordance with the designation] picking up the image of the object;
- a step of displaying an image;
- a step of displaying, in the display step, the low-resolution image data of the plurality of frames stored in the first storage step;
- a step of compressing and encoding, at a predetermined compression ratio,

the high-resolution image data [of the plurality of frames stored in the first storage step];

a second storage step of storing the compressed and encoded image data of the plurality of frames; and

a first selection step of selecting and outputting image data of a desired frame from the image data of the plurality of frames of the image stored in the second storage step, on the basis of display in the display step.

26. (Amended) A medium according to claim 23, wherein the control program further comprises a second selection step of selecting a desired image from the plurality of images based on the low-resolution image data of the plurality of frames displayed in the display step, and the [display control] step of displaying the low-resolution image data extracts image data corresponding to the image selected in the second selection step from the image data of the plurality of frames stored in the second storage step and enlarges and displays the extracted image data in the display step.